

<i>Topic</i>	T9.1 Meteorological traceability and uncertainty
<i>Oral or Poster Presentation</i>	Oral Presentation

DETERMINATION OF AUTOMATIC WEATHER STATION SELF-HEATING ORIGINATING FROM ACCOMPANYING ELECTRONICS

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Atmospheric air temperature values are fundamental in meteorology and climate studies. To achieve high accuracy in the measurements, features, characteristics and performances of instruments are of high importance. This paper focuses on the most commonly used temperature sensors within automatic weather stations (AWS), with a specific focus on evaluating the self-heating effect. Self-heating in AWS originates not only from the temperature sensor itself, but also from the electrical components housed together within. This effect introduces extra heating in the system, causing biases and errors in temperature records. Conducted measurements show the temperature change in the close vicinity of the thermometers over a time period of more than 66 hours with an electric current and voltage supply values recommended by the respective sensor manufacturers. Furthermore, the temperature changes after increasing the voltage supply levels up to 80% of the maximum voltage recommended by the manufacturer is presented as well. The results of overall self-heating indicated a +0.07 °C increase in temperature for the tested sensors when using the manufacturers recommended electric current supply. However, the usage of elevated voltage levels shows a considerably higher temperature increase in the vicinity of the temperature sensors. In the presented study, the measured difference from the initial measured temperature can be high as +0.32 °C.

Acknowledgements

This work is being developed within the frame of the EMRP (European Metrology Research Programme) joint research project ENV58 "METEOMET". Furthermore the work was supported by the Slovak R&D Agency, projects APVV-15- 0295, APVV-15-0164, the Scientific Grant Agency of the Ministry of Education of the Slovak Republic projects VEGA 2/0610/17, VEGA 1/0556/18 VEGA - 1/0098/18 and KEGA039STU-4/2017.